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This is a list of questions that I created by myself to fully understand and memorise the content for the CCNA. All of these questions are based on the summary I created, which can be viewed on the link below, which is based on JITL. Feel free to drop me an email at farisyazid1702@gmail.com if you have any comments.

I hope this is beneficial for those of you studying for the CCNA.

Summary: https://docs.google.com/document/d/1dK7hsFXH6ssvBVurgYYDfh0tFi3Sc5L5hMrp5SIxj-k/edit?usp=sharing

For the last few chapters, I got lazy to write questions so there are missing topics at the end

PDU

- What is PDU?
- Layer 5-7 (What is the PDU called)
- Layer 4
- Layer 3
- Layer 2
- Layer 1

OSI/ TCP/IP

- What is OSI?
- What is TCP/IP
- What are the 7 OSI layers
- What are the 4 TCP/IP layers
- Match OSI with TCP/IP
- Which OSI layer provide node-to-node
- Which OSI layer provide host-to-host
- Which OSI layer provide process-to-process

Ethernet

- Draw Ethernet Header
- List all properties
- ARP meaning and the 2 messages
- ICMP 2 messages
- What is the max size with payload
- Difference btw ARP and unknown unicast flooding

CSMA/CD

- What is the full name
- Explain how it works (what happens after collision)

Interface errors

- List all 6 errors

IP Header

- Draw the header and list the functions
- Draw the IP class table

VLAN

- List the 5 default VLANs
- Difference btw access port and trunk port
- Where is the 802.1q tag located
- Draw the 802.1q tag format
- State the VLAN ranges (e.g standard, extended, reserved, ISL)
- Which protocol support native VLAN
- Explain how native VLAN works
- What is used for a switch to act as a router
- What is used to auto create a trunk port
- What are the 2 modes
- What is VTP
- What are the 3 modes

STP

- What are the 2 things that STP is preventing
- What are the 3 states that ports have
- Explain how STP works (what routers are selected, what do they become)
- What is BPDU
- Give the ranking for root bridge selection, root port, designated port
- Draw the format of bridge ID
- Give the root cost
- Give the STP states table
- Give the STP timing table
- Ethernet destination MAC address for PVST+ and standard STP
- If the router is set to primary and secondary, what are the priority?

STP Optional feature

- Name the 5 features and how they work (what ports does it work on, what happens if receive BDPU)
- If enabled globally, what ports does it apply on

RSTP

- Root cost table

- STP port state table
- Name the 4 port roles, and explain (why they chosen for the role, backup for what role)
- What happen if interface with STP and another with RSTP merge
- Max age
- Name the 3 link types
- Name the 3 STP optional features included in RSTP

EtherChannel

- What is LAG
- What are the 3 modes
- Max number of interfaces for Etherchannel
- What are the states for each mode
- What must the same for the members?
- Must the EtherChannel number be the same

Dynamic Routing

- What are the 2 types (divided into 3)
- Name each protocol for the 3 dynamic routing protocols
- Explain how the protocols work and their metric (except BGP)
- List our the AD
- Explain RIP (versions, max hop count, msg type, multicast addr for which versions, timer)
- Explain EIGRP (multicast addr, metric, 4 terminology and condition, must the group number be same)

OSPF

- What is OSPF
- What is LSA and LSDB
- LSA default timer, what does it do
- 3 step process of sharing LSAs and finding best route
- Name the 4 types of router
- What are the 3 rules for an area
- Router ID priority
- What is the default reference bandwidth
- Min cost
- Default hello timer
- Hello message multicasts address
- IP header protocol number
- Name and describe the 7 neighbour states
- Name and describe the 5 messages
- Name and describe the 3 network types (how neighbour discovered, multicast addr, default timers)

- Name the 6 OSPF neighbour requirements and the 2 things that will allow neighbourship but not exchange LSAs
- Name the 3 LSA types

FHRP

- What is FHRP
- What is the problem
- How it works
- Name and describe the 3 types of FHRP

TCP/UDP

- Function of layer 4
- Name the 3 port ranges
- 3-way handshake
- 4 way handshake
- What is used for flow control in TCP
- 4 points TCP vs UDP
- What is TCP and UDP used for
- Port numbers

IPv6

- What is EUI-64
- How to get EUI-64
- Name the 7 types of addresses and describe them (Range, which part of the address represent what)
- What are the multicast addresses
- What are the 5 address scopes
- Draw the IPv6 header
- How to get solicited-node multicast address
- What is NDP
- What are the 2 NDP messages (and type)
- What is another function of NDP
- What are the 2 messages (multicast address and type)
- What is SLAAC and how to get interface ID
- What is DAD and the 2 messages

ACL

- What is ACL
- What are they made up of
- What do ACL have at the end of every list
- Name the 2 types of ACL
- What are the numbered ACL ranges for both types
- Protocols number

Layer 2 discovery

- What does it do
- What are the 2 types
- Describe them (default up, multicast addr, timers)
- Can run both simultaneously

NTP

- What is the 2 clocks a cisco device has
- What is NTP
- What is the accuracy over LAN and WAN/Internet
- What protocol and port number
- What is the top of the hierarchy
- What are the 3 NTP modes
- What is the max stratum
- What are the 2 server types
- What is the default stratum number if you set a router as a server

DNS

- What is DNS
- What does it do
- What protocol auto find DNS server
- When is UDP and TCP used for DNS
- A and AAAA record
- Port number for DNS
- For DNS to work, what to config

DHCP

- What is DHCP
- What does it do
- Which devices is DHCP applied
- What are the 4 messages
- What is used to determine whether broadcast/unicast
- Is the release unicast or broadcast, and from who
- Port numbers
- Explain DHCP relay

SNMP

- What is SNMP
- What are the 2 main devices
- What are the components in the devices
- What are the 3 main operations
- What is used to identify the variables in the MIB
- Name the 3 versions
- Draw the message table (message type, description, messages)

- Port numbers

Syslog

- What is it used for
- Give the format
- Give the severity table
- What are the logging locations
- Which one are logging sent to by default

SSH

- What is SSH
- What is telnet
- For telnet, what format is data sent in
- How many version of SSH
- If support SSH, what will be in the IOS image
- What IOS image used for devices with no encryption support
- What is used to generate RSA key
- What must be configured before generating RSA key

FTP/TFTP

- What is the full name
- When is TFTP preferred over FTP
- What can TFTP do
- What port is TFTP
- What does TFTP have that UDP don't
- Explain briefly the feature
- What are the 3 phases of file transfer
- Is the same port number used throughout
- What are the 2 FTP ports
- What does it have that TFTP don't have
- For greater security, use what
- What are the additional features
- What are the 2 connection types
- What are the 2 modes, who initiate the connection for which connection type
- What reason for the 2nd type

NAT

- What are the 3 range of private IP
- What does NAT means
- For static, map what to what
- For dynamic, what is used to determine which address to translate
- If not in the range, what happen
- What if the range is fully used
- What is PAT
- What is it also known as

- What does it do/overcome

QoS

- What is PSTN and POTS
- What is VoIP
- IP phone have how many internal ports, and to where
- How is phone call traffic separated from normal traffic
- How will the phone be informed to tag its traffic

- What is PoE
- What is PSE and PD
- What cable do they use
- Normally what device provide power, what does it do with the source power before providing to other devices
- What is used to prevent sending too much power to PD

- Basically, what does QoS do
- What are the 4 things it manages
- What are the 3 values for acceptable interactive audio quality

- What is classification
- Give 3 examples
- What is PCP also known as
- Name the 4 main PCP values
- Which is the lowest priority
- What values are used for IP phone
- Where can PCP be found in

- What is TOS
- What is the old one and new one called
- What is the old one main markings
- What is the 4 markings in the new one
- Give the explanation, format and DSCP value
- What are the markings for voice, interactive video, streaming video, high priority data, best effort

- If traffic being send out slower than receiving, what happens to the remaining traffic
- What happens if queue is full
- Why is it bad
- What are the 2 solutions
- Can there be multiple queues
- Who decides which queue can send traffic
- What are the 2 methods to select the queue
- Explain them and what is bad about them

- What is shaping and policing
- Which for outgoing and incoming
- What is PHB
- What is it

Security Fundamental

- What is the CIA triad
- Explain DoS and what is another type
- Explain spoofing
- Explain reflection attack, and a worse version
- Explain man-in-the-middle
- Explain reconnaissance
- What is malware, give 3 examples
- What is social engineering, 3 examples
- What is the attack that compromise commonly visited sites
- What are the 3 things in MFA
- What is used to ensure a website is legitimate
- What is AAA
- What are the 2 protocols

Port Security

- What does it control
- What must the port access mode be
- What can it protect against
- What are the 3 violation mode, explain
- What is a secure MAC address
- By default, do they age
- What are the 2 aging types
- Do secure static MAC address age
- What is sticky secure MAC address

DHCP Snooping

- What does it do
- What is the default for all ports
- What does it protect against
- What are the types of DHCP messages
- Which ports should set as trusted/untrusted
- What happens if receive on trusted ports
- What happens if receive on untrusted ports
- What happens when a client leases a new IP address
- What happens to interface if higher than set limit
- What are the 2 methods to reset

- What is Option 82
- What are the defaults related to it

Dynamic ARP Inspection

- What does it do
- What is the default for all ports
- What does it protect against
- What happens if receive on trusted ports
- What happens if receive on untrusted ports
- What is another method to config
- What happens if over rate limit
- What are the reset methods
- What is the benefit of rate-limiting
- What are the 3 optional check, explain

LAN Architecture

- What are the 2 campus LAN design
- What are the 3 layers
- Explain the 3 layers
- Draw an example of 2-tier and 3-tier designs
- What is the architecture used in data centres
- What are the 4 rules
- What is the architecture for homes/small offices

WAN Architecture

- What is it used for
- What are the 3 types of connections
- What topology used for the first type
- Explain leased lines
- What is MPLS
- What are the 3 routers
- What does MPLS create and how
- How does layer 2 and 3 MPLS work
- What type of connections can be used over the MPLS network
- What are 3 common methods to connect to Internet
- Explain DSL and CATV
- What are the 4 types of redundant internet connections
- What are 2 types of private WAN, are they secure
- How to secure connections over Internet
- What are the 2 types
- Explain how the 1st type works
- Another word for encryption key

- Limitations and solutions
- Explain the 2 solutions
- Explain how the 2nd type works
- Does it encrypt data
- Give 3 differences btw the 2 types of VPN

Virtualization

- Explain a server relation to number of OS before and after virtualization
- What is 1 OS instance called
- What is used to manage the OS instances
- What is it also called
- What is type 1 hypervisor also called (2 names)
- Draw type 1 hypervisor
- What is type 2 hypervisor called
- Where is type 2 usually run on
- Draw type 2 hypervisor
- What are 4 benefits of virtualization
- How are VMs connected to each other
- Explain 2 points
- What are the 3 main features of cloud
- Explain all of them briefly
- Give some benefits of cloud
- What are the 3 ways you can connect to cloud resources
- What are containers
- Draw
- What is term for a software that automates managing containers
- VM vs Container (boot up time, space, resources, portability, reliability)
- What is VRF
- What does it do
- What is it actually called, what does the actual VRF has extra
- Can IPs overlap

Wireless

- What is used to facilitate half-duplex communication in wireless network
- What are the 2 bands normally used in wireless networks
- Draw the 802.11 table
- What are the 3 types of service set and the 4 types
- Explain the 4 types
- What is a distribution system
- Can 1 AP have multiple BSS
- What are the 3 AP operation mode, explain

- Draw the 802.11 frame
- What are the 3 connection states
- What are the 2 ways device scan for BSS

- What are the 3 message types
- What are the 3 wireless AP deployments, explain
- Explain deployment types: local, flexconnect, sniffer, monitor, rogue detector, SE-connect, bridge/mesh, flex plus bridge
- What are the 4 deployment methods for split-MAC architecture

- What are the 3 main concepts in wireless security
- What are the 2 basic authentication methods, explain
- What is the new authentication framework
- What are the 3 entities in 802.1X, explain how it works
- What are their different types
- What are the 3 encryption/integrity methods
- What is WPA
- What are the 2 authentication modes
- Explain the protocols supported for each WPA version

- What is the difference btw WLC ports and interfaces
- What are the 4 types of ports
- What are the 5 types of interface
- What are the 4 QoS in Cisco WLC

Automation

- What are the 3 logical planes
- What is ASIC and TCAM
- When to use CPU and ASIC
- What is SDN
- What plane does it affect
- Draw the diagram

- What is API
- How is it used in Automation
- Draw the CRUD table
- Explain the HTTP Request
- List the 5 Http response
- What is REST
- What are the 6 rules

- What are the 4 API authentication types, explain